ALTERNATIVES

3.1 Alternatives Development

3.1.1 Range of Alternatives

Alternatives are strategies that are directly responsive to the purpose and need for a proposed project. The project alternatives are developed through consideration of a wide range of options, with the least competitive options eliminated throughout the process. The No-build alternative and Transportation Systems Management (TSM), including multimodal alternatives are also considered in the process. The alternatives are developed thorough a shared process that involves the FHWA, KYTC, other state and local planning agencies and the public.

As screening and detailed analyses (including engineering, environmental impacts, cost, benefits and public input) progress throughout project development, alternatives may be eliminated. A complete discussion of alternatives considered and those carried forward into this Draft Environmental Impact Statement are presented here.

3.1.2 Project Inception and Initial Feasibility Study

In 1991 Congress enacted the Intermodal Surface Transportation Efficiency Act (ISTEA) which provides federal assistance for highway studies, design, and construction, and contains policy to develop a National Intermodal Transportation System that is economically efficient and environmentally sound, provides the foundation for the Nation to compete in the global economy, and will move people and goods in an energy efficient manner. The ISTEA included a legislative mandate by Congress providing funding for an "Interstate 66 Feasibility Study" (also known as the Transamerica Transportation Corridor Feasibility Study) in 1991 to evaluate a new interstate corridor generally located between I-70 to the north and I-40 to the south.

Alternatives Analyzed in the Completed 1994 *Transamerica Transportation Corridor Feasibility Study*[1]

[1] Transamerica Transportation Corridor Feasibility Study, 1994, WSA, HNTB

The study investigated a wide range of alternatives and assessed each in terms of consistency with national policy and meeting the goals of ISTEA, which is:

> "to develop a National Intermodal Transportation System that is economically efficient and environmentally sound, provides the foundation for the nation to compete in the global economy, and will move people and goods in an energy efficient manner."

The range of alternatives investigated included three basic categories: *1) Mode and technology options*, (The mode and technology options were further grouped into three categories: a. Highway options, b. Fixed guideway options, and c. Multimodal options) *2) Joint use options* and *3) Corridor options*.

Alternatives considered included: Conventional Interstate-Type Highway, Super-Highway, Truckway, Advanced Tollway, Parkway, Conventional Railroads, Upgraded Railroads, Conventional Rail Upgrade with Increased Speed Capabilities, High Speed Rail Line, Very High Speed New Technology Rail, Combination Conventional Highway with Conventional or Upgraded Rail, Super-Highway with High Speed Rail, Conventional Interstate with Truckway, Super-Highway with Truckway and Joint use opportunities that utilize pipelines in the right-of-way (ROW) of the multimodal options above.

From these initial transportation concepts, and through the screening process, four principal alternatives and a corridor location were judged to have features that enhanced the viability of the Transamerica Corridor. The four alternatives included: *1. Conventional Interstate-Type Highway,* 2. Upgraded Rail, *3. Super-Highway with Truckway*, and 4. Very High Speed Fixed Guideway.

Recommended Alternatives from the Transamerica Corridor Study

The study concluded that the corridor concept is compatible with the ideas proposed in the ISTEA, but that currently a transcontinental route is not feasible. The study states that further evaluation may show that some segments of the Transamerica Corridor could represent a good investment and could be of beneficial from a state or regional perspective. The study estimated the economic development gains that would occur as a result of the Transamerica Transportation Corridor and concluded that the economic gains from the corridor perspective were significant.

The study concluded that from an economic analysis perspective, the highway and super-highway alternatives are the most likely candidates to achieve economic feasibility and even under considerably improved circumstances, the rail alternatives would not be feasible from an economic standpoint.

3.1.3 Kentucky Transportation Center Southern Kentucky Corridor Feasibility Study

The Kentucky Segment of the Coast-to-Coast I-66 Transamerica Corridor Study stated that segments of the Transamerica Corridor could be economically feasible as well as beneficial for individual segments of the transcontinental corridor. In 1997 the Kentucky Transportation Center prepared an Economic Justification and Financial Feasibility Study for the Southern Kentucky segment of the Transamerica Corridor. The purpose of the report, entitled Southern Kentucky Corridor I-66 Economic Justification and Financial Feasibility[2] (SKC I-66), was to determine the economic justification and financial feasibility of the Kentucky segment of the Transamerica Transportation Corridor.

3.1.4 Conclusions of the SKC I-66 Study

The study investigated the existing economic conditions of the 63 counties within the SKC I-66 corridor and found that many are economically distressed. The per capita income of the corridor region was $4,500 below levels in other parts of the state. The unemployment rate in the corridor region was 6.8% compared to 4.7% for non-corridor counties.

Economic Development

The study concluded that improved access to the SKC would result in economic development impacts that would include the increase in earnings, jobs, income and population. These impacts are particularly important for the corridor because of the existing economic conditions throughout the corridor region. Quality of Life benefits are also predicted to improve through increased access to key institutions such as employment centers, schools, medical care, recreation facilities and governmental services.

[2] Southern Kentucky Corridor I-66 Economic Justification and Financial Feasibility, 1997, Kentucky Transportation Center

Economic Benefits

The SKC I-66 concluded that a major highway improvement in the SKC corridor would be expected to generate from 48,300 to 63,800 person-years of work per year. This represents a 5.9 to 7.9 percent increase in expected employment for the 20-year period after the SKC I-66 is open to traffic. New manufacturing jobs alone are expected to account for 30% of all new jobs, substantially increasing the number of manufacturing jobs in Kentucky. Personal earnings are expected to increase between $1.4 billion to $1.9 billion per year, representing a 6.4% to 8.7% increase in expected earnings per year for the 2005 to 2025 time period if the SKC portion of I-66 is built. The improved transportation system would enhance regionalism by reducing driving time between communities. Improved regionalism is a crucial factor in improving incomes, poverty rates, and overall quality of life.

Cost Benefit Analysis

The economic justification of the SKC was examined by comparing the benefits and costs. When benefits to road users exceed the cost of providing the facility, the project is determined to be justified. Time savings, increased safety and reduced vehicle operating costs as a result of diverting traffic from other highways to the I-66 corridor were calculated in the study. *At a 4% discount rate (reasonable and based on the real rate of return on investments after adjustment for inflation) it was concluded that the benefit/cost ratio exceeded 1.00 (justified) for all alternatives having a 70 mile per hour design speed*[3]*.* When the increase in wages in the corridor was factored in, the benefits of constructing I-66 through Southern Kentucky were four times greater than costs.

Priority Segments

The SKC study determined that the traditional interstate highway with a design speed of 70mph was the preferred alternative for SKC 1-66 based on

[3] For more detailed information on analysis see Pages 26-36 of 1997 Feasibility Study

economic potential. The SKC I-66 went on to identify priority segments for construction due to the large financial commitment that would be required to construct the entire facility. By identifying segments which could link major existing highways, large continuous segments of I-66 could be quickly created with a reduction in financial challenges. The study identified the segment between Somerset and London as the highest priority segment because it would provide a continuous interstate-type highway linking I-75 and I-65.

3.1.5 Southern Kentucky Corridor Planning Study

The SKC I-66 study identified the Somerset to London segment of I-66 as the highest priority segment I-66 across the state of Kentucky. In June 2000 the Kentucky Transportation Cabinet published a planning study entitled *I-66 Southern Kentucky Corridor*[4].

3.1.6 Alternatives Evaluated in the SKC I-66 Study

Alternative Parameters

The SKC I-66 study developed upon the previous feasibility studies and economic analyses and evaluated engineering and cost impacts based on typical sections that included: 70mph design speed (as identifies as preferred in feasibility study), moderate horizontal and vertical curvature, access available at interchanges only, four 12 foot lanes, and approximated right-of-way limits of 125 to 500 feet depending on terrain. Cost estimates used in economic analyses utilized these criteria as formulated from 1997 Economic Feasibility Study.

Alternative Corridors (path of study at least 2000 feet wide) Studied

The proposed alternatives included: 1. Upgrade KY 80 and 2. The development of new corridors.

Upgrade of KY 80

The existing KY 80 corridor is made up of two- and four-lane sections, with four-lane ROW along the entire corridor. The KY 80 corridor development would require horizontal and vertical alignment changes to meet interstate standards. In addition, there are several issues that would have to be addressed in the upgrade of KY 80, they include:

- Access is currently provided only at designated locations. Minimum spacing requirements for partial control of access are 1200 feet in rural areas and 600 feet in urban areas. In Pulaski County there are approximately 55 separate entrances and approximately 51 entrances in Laurel County. In addition there were an estimated 1800 parcels of land that would be impacted (within 500 foot ROW) in order to achieve full control access associated with an interstate facility.
- During construction, maintenance of traffic would be very difficult along the existing alignment of KY 80 wherever horizontal or vertical curvature changes are required.
- Interchange locations would be needed at key crossroads to maximize their placement and maintain safety and capacity of the existing network.
- Overpass or underpass structures will also be necessary when crossing routes that do not meet interchange criteria.
- Without the use of frontage roads along the entire KY 80 corridor, ROW acquisition would be extremely expensive in order to maintain fully controlled access. In addition, the use of frontage roads would require a wider typical cross-sections (more ROW), more road maintenance, additional construction and increased potential for more interchanges.

Corridor Alternatives

Nine (9) corridor alternatives were developed, utilizing the north, middle and southern portions of the study area (Pulaski, Laurel and Rockcastle Counties). There were four northern, one middle and four southern alternatives developed and evaluated for environmental and socioeconomic concerns. The proposed corridors are shown in figure 3.1.6-1.

3.1.7 SKC I-66 Alternatives Analysis

The alternatives analysis in the SKC I-66 study considered three categories of criteria for evaluating each proposed corridor. The categories included: Traffic and Socioeconomic Issues; Environmental Issues; and Engineering and Construction Issues.

Traffic and Socioeconomic Analyses

This category of criteria considered both travel benefits and the relative social, economic and land use impacts associated with the various corridor alternatives. Travel benefits accounted for projected traffic volumes, time and distance savings, total travel service, accident savings, and transportation system connectivity.

From a travel benefit standpoint, the analyses indicated that the North and KY 80 alternates generally offered a greater degree of travel benefits. These alternatives tended to carry a larger amount of traffic, save more time and reduce more accidents. Estimated traffic volumes and related travel benefits analyses indicate that N-4, KY80, N-1, and N-3 are the most beneficial of the corridors. From a transportation system standpoint, the N-4 and N-1 alternatives were shown to be preferable due to the increased degree of service connections provided by their location between the communities of London and Corbin.

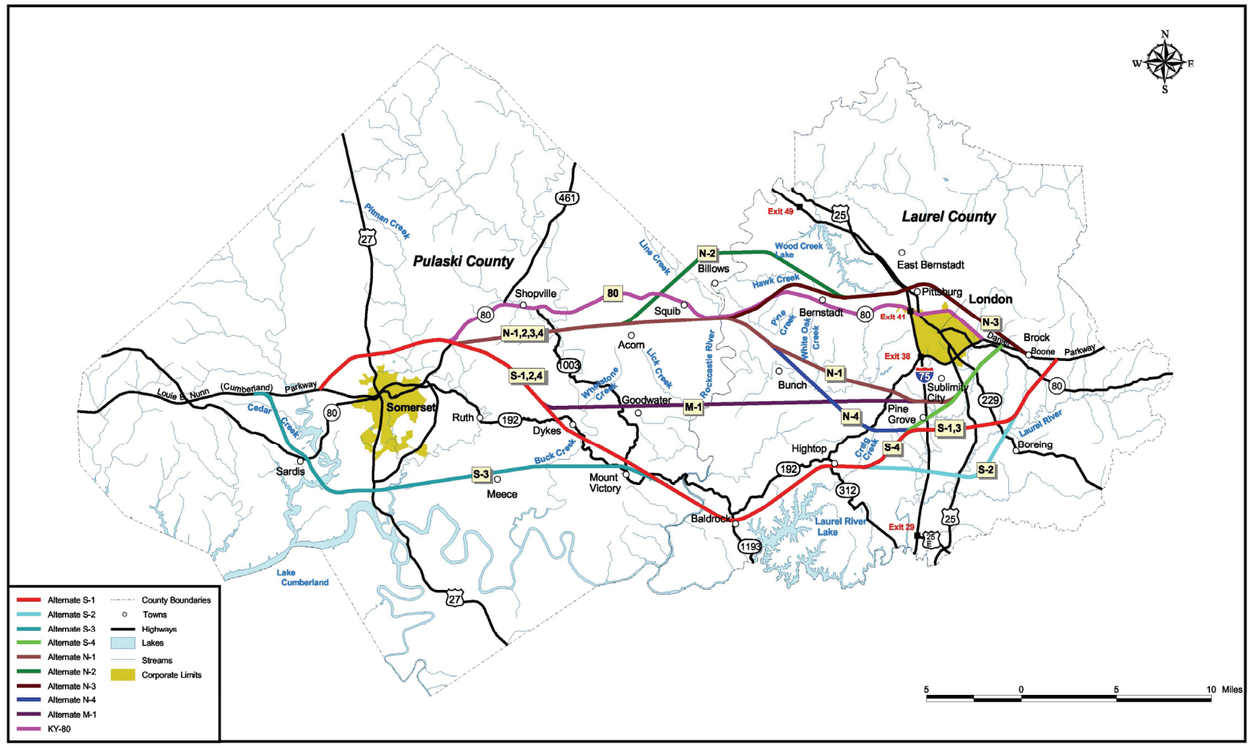

Figure 3.1.6-1 – Alternatives Analyzed in the I-66 Southern Kentucky Corridor Study

[4] I-66 Southern Kentucky Corridor between the Louie B. Nunn (Cumberland) and Daniel Boone Parkways, Kentucky Transportation Cabinet, June 2000

Social and economic benefits account for the ability of corridor alternatives to minimize the expected displacement of homes and businesses; to serve recreational facilities, industries and businesses; and to minimize adverse impacts to disadvantaged population groups of low income and minority citizens. Within this category, the alternatives had varied results. Because of its impacts to a developed corridor, the KY 80 alternative is expected to affect more existing homes and businesses through displacement. Relative to recreational serviceability, the south alternatives were generally better than other alternatives, while the KY 80 and M-1 alternatives provided better industrial service. From an environmental justice standpoint, the N-4 and N-1 alternatives offered the greatest likelihood of avoiding disproportionate impacts to minority and low income populations.

Environmental Issues

The environmental analyses identified potential issues within buffer zones of either 500 or 2000 feet in width along each proposed corridor. Investigated environmental issues included: cultural and historic resources; native species; natural areas and other environmental issues. In the analysis of environmental issues, input and concerns of environmental resource agencies of the state and federal government; public citizens and area stakeholders were given particular consideration. Some of the issues most often cited as being critical concerns relative to the corridors included:

- Impacts to the Daniel Boone National Forest
- Karst Geology including Sinkholes and Underground Caves
- Lakes, Rivers and Stream Crossings
- Plant and Animal Impacts

Alternative Impacts to Environmental Resources

KY 80 Corridor

Because it seeks to reconstruct and widen an existing highway corridor, the KY 80 alternative is expected to have the least impacts to natural areas than any of the other corridors. Typical for a developed corridor, the KY alternative is expected to have greater impacts to cultural sites, archaeological sites and developed land uses.

North Corridor

The north alternatives are expected to have lesser impacts to natural areas; threatened and endangered species; and historic structures than any of the other corridors that would require construction on new location (middle and south alternatives). All of the north alternatives either avoid the Kentucky designated Wild River (Rockcastle River) or cross at the location of the existing KY 80 bridge. The N-2 and N-3 alternatives presented concerns due to their close proximity to Wood Creek Lake. As for cultural resources, varied impact levels are seen with the north corridors, with generally higher than average impacts to potential archaeological sites.

Middle Corridor

This corridor provides the least anticipated impact to cultural and social land uses but may have some of the highest impacts to forested and sensitive areas among all of the corridor alternatives. In particular, this corridor would pass through the largest portion of the DBNF and would create a new crossing of the Rockcastle River in the Kentucky Wild River designated area.

South Corridor

The south corridor alternatives are anticipated to create lesser impacts to archaeological sites and historic structures but may have had some of the highest impacts to natural areas; threatened and endangered species; and area lakes. All of the south alternatives pass in close proximity to Laurel River Lake and the S-3 alternative would also create a new crossing of Lake Cumberland. These alternatives fall in close proximity to the Cane Creek Wildlife Management Area and pass through some sensitive and pristine areas of the DBNF.

Engineering and Construction Issues

Engineering and construction issues, along with overall costs for each alternative were evaluated based upon the criteria outlined in section 3.1.6 *Alternative Parameters*, using basic unit cost estimates formulated by the KYTC as part of the 1997 Economic Feasibility Study of the I-66 corridor. Cost components for design, right-of-way, utilities, bridges, interchanges and construction were calculated.

Alternatives Engineering and Cost Comparison

The KY 80 alternative was calculated to have the most expensive overall cost and per-mile cost of any corridor alternative. The north alternatives generally provided a lower overall and per-mile cost; however alternatives N-2 and N-3, which passed north of London, entailed high interchange costs because of the high cost of elevated bridge structures required for the I-66/I-75 interchange due to proximity of CSX railroad and US25. The middle alternative offered the least expensive overall costs. The south alternatives showed high overall costs due to the length of their construction.

3.1.8 Public Input on I-66 SKC Corridors

The first public meetings held in conjunction with the corridor study were in June 1999. Generally those in favor of the project cited economic improvements, travel benefits and safety improvements for the region. Many of the citizens were opposed to the south corridor, with opposition focused on damage to the environment in relation to the most pristine areas of the DBNF and potential effects to the area's endangered species, rivers and streams. Due to the input from the public at these meetings the KY 80 corridor (previously discussed in each section above) was added and evaluated.

A second set of public meetings was held in March 2000, and was attended by over 500 individuals. Sixty-six percent (66%) of respondents were in favor of I-66, with sixty-four percent (64%) favoring either the north or KY 80 corridor (35% KY 80, 29% North).

3.1.9 Alternatives Considered but Eliminated from I-66 SKC Corridor Study

The KY 80 upgrade alternative was eliminated from further study based on cost to complete calculations; access control and right-of-way issues; and geometric design and operational issues. Access to an upgraded KY 80 would only be at selected interchanges and all residences and business would lose access along the corridor. Frontage roads would be needed for the entire length of the project and would require significant cost and ROW increases. The upgrade alignment would disrupt or displace concentrated business development just west of London, including the Wal-Mart distribution facility. *While the KY 80 alternative was not considered in its entirety, it was recognized that from Somerset to east of the Rockcastle River, the selected corridor should include portions of the KY 80 corridor to the maximum extent possible.*

The Middle alternative was eliminated from further study based on low levels of predicted traffic service, impacts to undisturbed natural areas, potentially prohibitive impacts to Kentucky Wild River and public input.

The South alternative was eliminated from further study based on below average traffic use, potential impacts to pristine areas of the DBNF, potential impacts to endangered species, high construction cost and overwhelming public opposition to south alternative.

3.1.10 The Preferred Corridor Alternative from SKC I-66 Study

On April 26, 2000, an Interdisciplinary Team (IDT) meeting was held with representatives from throughout the Transportation Cabinet. Included in the meeting were representatives from the Office of the Secretary, Office of the State Highway Engineer, Districts 8 and 11, Program Management, Design, Bridges, Construction, Environmental Analysis, Materials/Geotechnical, Operations and Right-of-Way/Utilities. Also included in the meeting were representatives from the Lake Cumberland and Cumberland Valley Area Development Districts and the Federal Highway Administration. The meeting included a review of the background of the study and prior project activities, project alternatives, discussion of advantages and disadvantages of each corridor alternative, analysis methodology, and summary of public input.

Based upon all of the concerns expressed, meeting participants were able to proceed through the corridor alternatives and arrive at a consensus recommendation for the project. Consensus was reached among meeting attendees on recommendation of a corridor alternative that would be largely representative of the N-4 alternative with appropriate opportunities to utilize the existing KY 80 east of the Rockcastle River maximized.

It is from the N-4 and N-4/KY 80 "hybrid" that the DEIS study corridor, study bands and eventual alternatives were derived.

3.1.11 Other Alternatives Previously Considered but Eliminated

From the 1991 Transamerica Feasibility it was recommended that a traditional interstate-type highway or superhighway be considered for further study. It was determined that from an economic benefit standpoint that the other alternative could not be justified. The 1997 feasibility study concluded that of the interstate-type highway and superhighway, that a traditional interstate with a design speed of 70 mile per hour presented the best alternative from a cost/benefit standpoint.

For additional information, including cost/benefits analyses, environmental findings and socioeconomic issues of the previously studied corridors, refer to the feasibility and planning studies previously described.

3.2 I-66 Somerset to London Segment Alternatives

3.2.1 From "N-4" Corridor to Highway Alignments

The alternatives studied in this DEIS are a result of a two phase approach. The phase 1a studies investigated the environmental and engineering concerns on a large (up to 5 miles wide) corridor, centered on the previously proposed N-4 corridor. The phase 1a studies provided the necessary information to assess the potential impacts to area resources including: socioeconomic issues, potential wildlife impacts, hazardous material, cultural resources, air quality and noise. The phase 1a information was assembled, analyzed and presented to the public for comment. Utilizing engineering control, environmental resources and public input, the large corridor was narrowed to alternative "bands" (approximate 1000 foot width). The bands included:

- KY 80 Band
- Band B
- Band D
- Band G
- Band H
- Band I

More exhaustive phase 1b studies were conducted within the alternative bands and utilizing environmental information and public input, roadway alternatives (with specific centerline and rights-of-way) were designed within the proposed bands. For more information on the public involvement in the process, please refer to chapter 8 of this document.

3.2.2 Alternatives Studied and Presented in This DEIS

The No Build Alternative

The No-Action Alternative is just as the name implies, involving no construction of I-66 from Somerset to London, and leaving the existing highway system in place. This alternative does not meet the goals and objectives of the Purpose and Need for the project (presented in chapter 2). It would not advance the completion of the Southern Kentucky Corridor (I-66), would not enable a controlled-access link between two sections of controlled access roadway (I-65 and I-75), would not facilitate future economic development and would not improve the transportation system linkage of the project area to larger population centers.

Transportation Management Alternatives

Transportation Management Alternatives considered for the proposed project are a combination of "Transportation Demand Management" (TDM) and "Transportation System Management" (TSM) concepts, as well as modes of mass transit that would not address the identified needs of the immediate project area or the legislative mandate issued by the U.S. Congress for the Transamerica Transportation Corridor. A description of the concepts and modes of mass transit considered are provided below.

TDM alternatives are relatively low-cost ways of reducing travel demand and improving traffic flow. TDM alternatives consist of programs or policies focused on either reducing the number of vehicles on the highway or distributing trips to less congested periods of the day. The goal of these alternatives is to relieve peak hour traffic congestion. These programs and policies include van/car pooling, non-motorized facility enhancements such as sidewalks and bicycle lanes, congestion pricing that would charge the users a varying fee based upon the amount of vehicles on the roadway, and employer-based trip reduction programs such as telecommuting and flexible work schedules. While any of these potential alternatives would address travel demand and traffic flow on a roadway, they would not meet the identified Purpose and Need for the project.

TSM alternatives are relatively low-cost ways of reducing traffic congestion and improving traffic flow. TSM alternatives consist of techniques or applications focused on improving the transportation networks ability to handle traffic volumes by increasing its travel efficiency. These techniques and applications include the use of expanded Intelligent Transportation System applications including technology-based programs intended to actively manage the transportation system. These programs provide improved access to travel information that allows a traveler to adjust their particular routes in response to changing traffic conditions. Information provided to users of the system typically includes travel times, crash locations and other service interruptions. The means of providing this information may include: signage on affected facilities, web sites with map and/or real-time pictures, and broadcasts on dedication radio stations. Additionally, TSM alternatives include the use of Incident Management Programs that provide timely responses to traffic incidents that affect congestion, reversible lanes and High Occupancy Vehicle (HOV) lanes. The TSM alternative is generally only relevant for major projects in areas over 200,000 in population. The more urbanized areas of Pulaski, Rockcastle and Laurel counties have populations that are well below 200,000 in total. Areas within the proposed study area of this proposed project are sparsely populated, in general and would not support efforts such as ridesharing. While any of these potential alternatives could address congestion on a roadway, they would not meet the identified Purpose and Need for this project.

Mass Transit Alternatives

Mass Transit alternatives include the implementation of bus routes and light rail, neither of which are present in the project area. A study entitled *Regional Transportation Planning and Non-Highway Alternative Consideration*[5] highlights the lack of mass transit options in the project area. There is an overall lack of bus, rail and other mass transport for the general public. The development of mass transit alternatives is not reasonable in the sparsely populated project area and would not meet the Purpose and Need of this project.

Interstate Highway Alternatives

Efforts were taken to identify areas containing sensitive resources early in the process of developing viable build alternatives. Methods utilized in the identification of these resources included a windshield survey of the project area, as well as the use of existing aerial photography and topographic mapping to help avoid sensitive areas. Identified resources included large wetland complexes, minority and low-income communities, as well as areas where the predominate land use was residential housing. These efforts have resulted in the development of study bands and eventually alignments that help to minimize potential impacts associated with the proposed action.

General Description of the Build Alternatives

Eleven Build Alternatives are being considered as locations for potential I-66 Somerset to London alignment options, in addition to a No Build alternative in the area. As previously stated this segment of the I-66/Southern Kentucky Corridor extends eastward from the proposed Somerset Northern Bypass in Pulaski County, through the Daniel Boone National Forest, to I-75 south of the existing KY 80/I-75 interchange in Laurel County, Kentucky.

Termini Selection

Pulaski County

The Pulaski County alternatives developed for this project show two individual termini on the eastern end of the project. These termini both tie into the Somerset Northern Bypass (I-66) in the vicinity of existing KY80. The Somerset Northern Bypass is currently in the right-of-way authorization phase but the purchase of right-of-way in the vicinity of the Somerset to London segment of I-66 will be held until the selection of a preferred alternative. If a build alternative is selected as the preferred alternative the project tie-in to the Somerset Bypass will be identified and interchange locations will then be finalized.

Laurel County

Locations for the terminus of the proposed I-66 with the existing I-75 were evaluated in the June 2000 I-66

[5] Regional Transportation Planning and Non-Highway Alternative Consideration; I-66 Between Somerset and London; KYTC, December 2002.

Southern Kentucky Corridor planning study. The study looked at several interchange options including construction to the north of London, at the existing KY80/I-75 interchange location, and to the south of London. Interchange locations north of London were eliminated based on the number of bridge sections that would be required to cross I-75, the CSX railroad and US 25. Interchange locations to the north could also impact Wood Creek Lake.

Locating the interchange at the present I-75 interchange locations is not practicable. The interchanges would have to be completely reconstructed to convert from the current diamond configurations to a configuration with directional ramps necessary for the connection of the two limited access interstate facilities, and would only permit direct access between the two interstate facilities, eliminating, or severely affecting the access to all of the properties currently located at the present locations. Reconstruction of existing interchanges would likely cause local business and community disruption.

Interchange locations to the south of London were investigated and it was concluded that considering the London-Corbin airport; urban buildup; and the spacing requirements for interchanges, the most suitable location for an interchange of I-66 with I-75 would be between Milepoint 29 and Milepoint 36. This location would also better serve the travel demand from the Corbin area. The interchange locations presented in the alternative mapping at the end of this chapter and in figure 3.2.2-1 (on the following page) are located in that section of I-75 between London and Corbin.

The alternatives are presented as Pulaski County Alternatives and Laurel County Alternatives with commonality at the Rockcastle River Crossing. A complete I-66 Somerset to London alternative is the combination of any one of the Pulaski County alternatives with any one of the Laurel County alternatives.

A brief description of each alternative is provided below.

Pulaski County Alternatives

Alternative K
Alternative K follows the same alignment as Alternative B to Doolin Knob then Alternative K travels north and follows KY 80 Modified to the existing crossing point of the Rockcastle River.

KY 80 Shifted
The first two miles of Alternative KY 80 Shifted is on a new location from a point on the proposed Somerset Northern Bypass eastward to existing KY 80 at the KY 461 Intersection. The Alternative runs parallel to KY 80 while utilizing KY 80 as a frontage road throughout the alignment. It transitions back to KY 80 about 4000' past Tommy Rock Church Road before crossing the Rockcastle River at the existing crossing point.

KY 80 Modified
The first two miles of Alternative KY 80 Modified is on a new location from a point on the proposed Somerset Northern Bypass eastward to existing KY 80 at the KY 461 Intersection. This Alternative utilizes KY 80 as part of the Interstate while providing a frontage road throughout the alignment to the north. This alignment crosses the Rockcastle River at the existing crossing point.

Alternative B
Alternative B begins at the proposed Somerset Northern Bypass and moves eastward along the southern part of the corridor. Approximately 3,500 feet east of KY 692 the alignment transitions north, crossing SR 1003 and KY 80. Alternative B then parallels KY 80 to the north before transitioning back and crossing the Rockcastle River on the existing bridge.

Alternative D
Alternative D begins at the proposed Somerset Northern Bypass and travels eastward along the southern part of the corridor. The alignment continues eastward approximately 4,000 feet south of KY 80, crossing SR 1003 and Buck Creek, and turns northerly to cross SR 1675. Alternative D continues easterly, tying into KY 80 to cross the Rockcastle River on the existing bridge.

Alternative B-D
As the name suggests, this is a combination of Alternatives B and D. Alternative B-D begins at the proposed Northern Bypass, moving eastward along the B alignment until crossing KY 80 near the intersection with Price Valley Road. From this point Alternative B-D is on new location, moving southerly to tie into the D alignment west of the crossing of Wadkins-Arthur Road. Alternative B-D then follows the D alignment to tie to KY 80 before crossing the Rockcastle River on the existing bridge.

For a visual description of each individual Pulaski County alternative, refer to the alternative mapping provided at the end of this chapter.

Laurel County Alternatives

Alternative G
Alternative G utilizes the existing crossing at the Rockcastle River and follows KY 80 for 3 miles before turning to the southeast and tying to I-75 at the eastern terminus. Alternative G is the northern most of the three proposed Build Alternatives in Laurel County.

Alternative H
Alternative H utilizes the existing crossing at the Rockcastle River and follows KY 80 for 1.5 miles before turning southeast and transitioning to I-75. Alternative H is the middle of the three proposed Build Alternatives in Laurel County.

Alternative I
Alternative I would begin at the existing Rockcastle River crossing and move eastward utilizing 0.5 miles of the existing KY 80 before transitioning southeast to I-75. Alternative I would be located south of Willie Green Road and crosses KY 192 north of Cold Hill School. Alternative I is the southern most of the three proposed Build Alternatives in Laurel County.

Alternative L
Alternative L follows Alternative G eastward from the existing crossing of the Rockcastle River to KY 1535. The alignment would then turn south to cross Sinking Creek and joins Alternative H approximately 1400' prior to Willie Green Road. After crossing Maple Grove Road, Alternative L continues south to intersect Alternative I close to Sizemore Road and follows the same alignment as Alternative I to I-75.

Alternative M
Alternative M follows Alternative G from the Rockcastle River to approximately Gregory Lane and continues south to join Alternative I close to Sizemore Road. Alternative M follows the same alignment as Alternative I to I-75.

For a visual description of each individual Laurel County alternative, refer to the alternative mapping provided at the end of this chapter. The "dashed" lines at the eastern terminus of the Laurel County alternatives indicate additional environmental study area beyond the proposed facility.

3.2.3 Design Features

The project would be designed according to the Kentucky Department of Transportation design guidelines for interstate facilities with depressed medians. The proposed design would involve sufficient right-of-way for the construction of a four-lane facility.

The project is proposed as an addition to the National System of Interstate and Defense Highways (Interstate System). Current policies on the design guidelines for the Interstate System require that the facility have full control of access. Therefore, pedestrian and bicycle usage would be prohibited. Access to the new roadway would be restricted to interchanges at various proposed locations. The proposed roadway would feature two 12 ft. driving lanes in each direction, 12 ft. outside shoulders, and a minimum median width of 60 ft. with 6.0 ft. inside shoulders and an outside slope ratio of 6:1.

Summary of design criteria:

The design criteria specified to date for I-66 are:

- Design Speed – 70mph;
- Pavement – 2 Lanes in each direction at 12ft per lane; Median – 60ft Depressed;
- Shoulder – 12ft, 10ft paved (outside);
- Maximum Superelevation – 8.0%;
- Ditch Slope – 18ft at 6:1;
- Minimum Allowable Curve Radius – 1810ft;
- Minimum Curve Radius Used – 2000ft;
- Max Grade – 4%;
- Minimum Stopping Sight Distance – 730ft.

Figure 3.2.3-1 on the following page is a graphical depiction of a typical section for the proposed I-66 and includes the design parameters described above.

3.2.4 Alternatives Cost Comparison

Table 3.2.4-1 provides an estimated cost comparison for each of the proposed build alternatives.

3.2.5 Alternatives Resource Impact Comparisons

Tables 3.2.5-1 and 3.2.5-2 on the following pages provide a summary matrix of project related impacts on area resources per alternative and by alternative combination. For more detailed information on project impacts to the natural and human environment, as well as descriptions of resources in the study area, refer to chapters 4 and 5 of this DEIS.

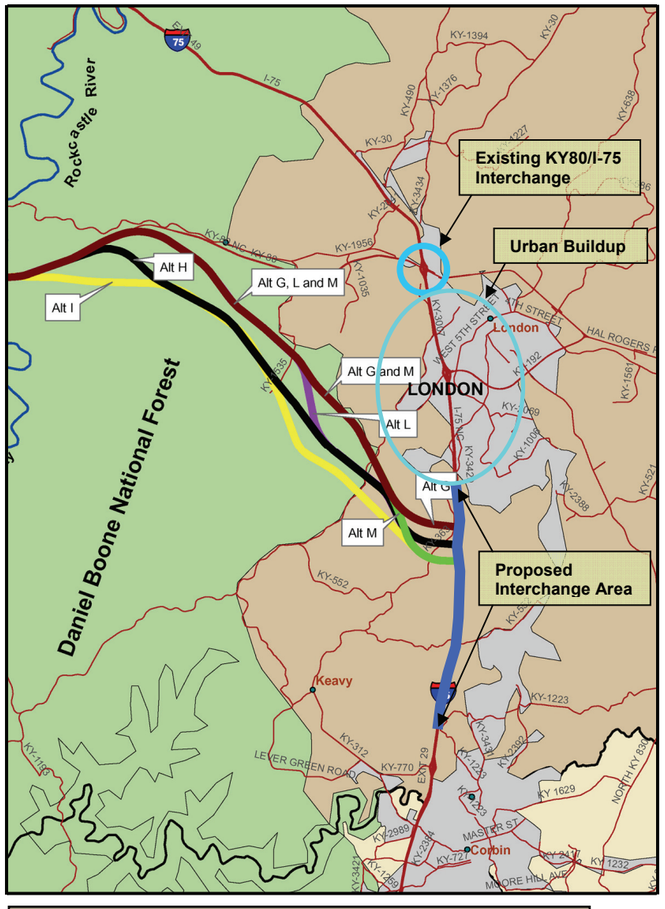

Figure 3.2.2-1 – Potential I-66 Interchange Locations Identified in the June 2000 Planning Study

Table 3.2.4-1 - Estimated Costs Associated with the Construction of Interstate 66 by Alternative (in dollars)

	Construction Costs						Right-of-Way Costs	Utilities	
Alternative	**Pavement Cost**	**Bridge Cost**	**Earthwork Cost**	**Appurtances**	**Mitigation & Enhancements**	**Mobilization & Demobilization**	**ROW**	**Utilities**	**Total**
Pulaski County Alternatives									
Alternative B	33,362,448	15,482,000	61,236,960	22,016,282	6,604,884	5,944,396	12,200,000	4,675,000	161,521,970
Alternative B-D	31,995,700	27,064,000	49,554,484	21,722,837	6,516,851	6,158,424	12,600,000	3,750,000	159,362,296
Alternative D	32,907,411	27,925,400	66,705,244	25,507,611	7,652,283	6,887,055	12,300,000	2,735,000	182,620,004
Alternative K	40,482,129	14,116,400	33,590,220	17,637,750	5,291,325	5,000,302	13,200,000	9,275,000	138,593,126
Alternative KY80 Modified	43,340,222	12,072,200	36,513,892	18,385,263	5,515,579	5,212,222	13,100,000	10,105,000	144,244,378
Alternative KY80 Shifted	41,205,984	11,734,800	43,888,124	19,365,782	5,809,734	5,490,199	18,100,000	10,430,000	156,024,623
Laurel County Alternatives									
Alternative G	50,200,000	24,151,000	49,200,000	24,710,200	7,413,060	7,005,342	40,100,000	9,315,000	212,094,602
Alternative H	47,200,000	23,750,000	58,000,000	25,790,000	7,737,000	7,311,465	32,700,000	8,915,000	211,403,465
Alternative I	43,400,000	28,710,000	65,200,000	27,462,000	8,238,600	7,785,477	17,100,000	6,475,000	204,371,077
Alternative L	46,400,000	28,200,000	45,600,000	24,040,000	7,212,000	6,815,340	23,300,000	7,315,000	188,882,340
Alternative M	48,700,000	26,100,000	48,800,000	24,720,000	7,416,000	7,008,120	23,400,000	7,105,000	193,249,120

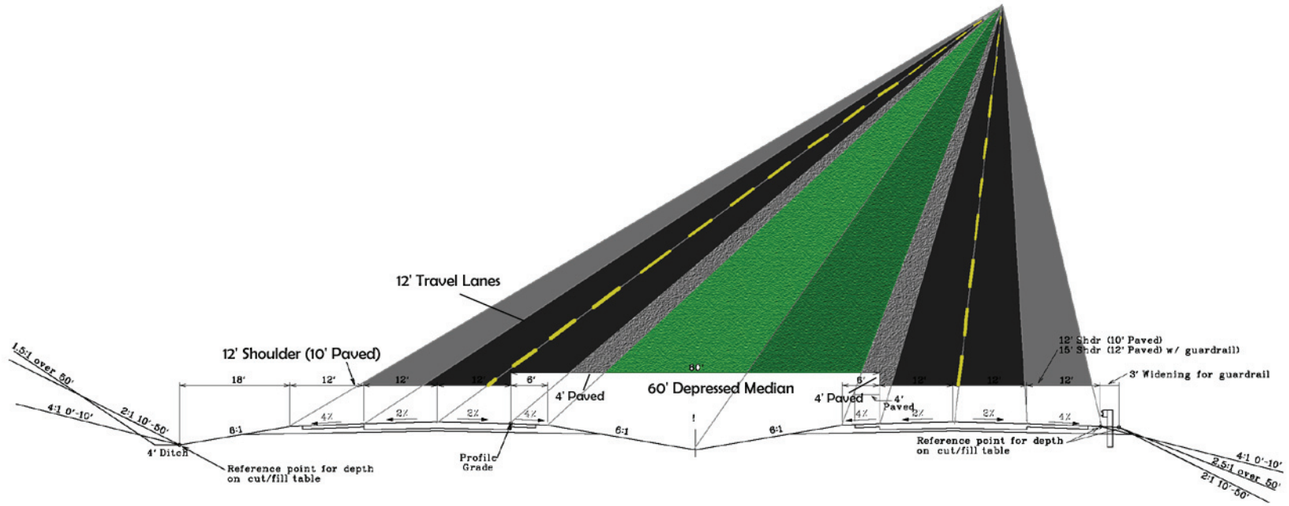

Figure 3.2.3-1 – I-66 Depressed Median Typical Section

Table 3.2.5-1 – Interstate 66 Project Related Impacts by Alternative to the Human Environment

Composite Impact Summary per Alternative Combination (Human Environment)												
	Impacts											
Alternatives	Residential Relocations (s=single residence; m=mobile home)	Business Relocations	Number of Community Resources Displaced	Acres of Prime Farmland Converted	Hazardous Materials Sites Recommended for Phase II	Air Quality Sites Exceeding NAAQS	Noise Receivers Impacted	Representative Noise Receivers Impacted	Number of Historic Properties Affected	Number of 4(f) Resources Used	Number of Section 6 (f) Resources Impacted	Number of Archaeological Sites Potentially Affected
Pulaski County Alternative												
Alt. K	10s/9m	0	0	163.3	2	0	18	74	1	2	0	20
KY 80 Shifted	22s/22m	5	1	142.0	4	0	13	66	2	3	1	20
KY 80 Modified	11s/12m	4	0	197.0	4	0	19	85	2	3	0	20
Alt. B	10s/6m	1	0	168.0	2	0	11	38	1	2	0	8
Alt. D	6s/8m	0	0	58.5	0	0	13	42	0	1	0	8
Alt. B/D	9s/5m	0	0	71.8	2	0	15	46	0	1	0	8
Laurel County Alternative												
Alt. G	56s/51m	0	0	87.0	6	0	13	114	0	2	0	6
Alt. H	39s/39m	1	0	96.0	1	0	12	125	2	4	0	3
Alt. I	24s/14m	0	0	77.0	0	0	16	137	1	3	0	8
Alt. L	27s/34m	0	0	104.0	5	0	12	117	2	4	0	3
Alt. M	10s/42m	0	0	81.0	6	0	14	114	0	2	0	7
Alternative Combinations (From Above; One Pulaski County Alternative + One Laurel County Alternative = I-66 Project from Somerset to London)												
No Build	0	0	0	0	0	0	0	0	0	0	0	0
K-G	66s/60m	0	0	250.3	8	0	31	188	1	4	0	26
K-H	49s/48m	1	0	259.3	3	0	30	199	3	6	0	23
K-I	34s/23m	0	0	240.3	2	0	34	211	2	5	0	28
K-L	37s/43m	0	0	267.3	7	0	30	191	3	6	0	23
K-M	20s/51m	0	0	244.3	8	0	32	188	1	4	0	27
KY80 Mod-G	67s/63m	4	0	284	10	0	32	199	2	5	0	26
KY80 Mod-H	50s/51m	5	0	293	5	0	31	210	4	7	0	23
KY80 Mod-I	35s/26m	4	0	274	4	0	35	222	3	6	0	28

Table 3.2.5-1 – Interstate 66 Project Related Impacts by Alternative to the Human Environment

Composite Impact Summary per Alternative Combination (Human Environment)												
	Impacts											
Alternatives	Residential Relocations (s=single residence; m=mobile home)	Business Relocations	Number of Community Resources Displaced	Acres of Prime Farmland Converted	Hazardous Materials Sites Recommended for Phase II	Air Quality Sites Exceeding NAAQS	Noise Receivers Impacted	Representative Noise Receivers Impacted	Number of Historic Properties Affected	Number of 4(f) Resources Used	Number of Section 6 (f) Resources Impacted	Number of Archaeological Sites Potentially Affected
KY80 Mod-L	38s/46m	4	0	301	9	0	31	202	4	7	0	23
KY80 Mod-M	21s/54m	4	0	116	10	0	33	199	2	5	0	27
KY80 Shifted-G	78s/73m	5	1	229	10	0	26	180	2	5	1	26
KY80 Shifted-H	61s/61m	6	1	238	5	0	25	191	4	7	1	23
KY80 Shifted-I	46s/36m	5	1	219	4	0	29	203	3	6	1	28
KY80 Shifted-L	49s/56m	5	1	246	9	0	25	183	4	7	1	23
KY80 Shifted-M	32s/64m	5	1	223	10	0	27	180	2	5	1	27
B-G	66s/57m	1	0	255	8	0	24	152	1	4	0	14
B-H	49s/45m	2	0	264	3	0	23	163	3	6	0	11
B-I	34s/20m	1	0	245	2	0	27	175	2	5	0	16
B-L	37s/40m	1	0	272	7	0	23	155	3	6	0	11
B-M	20s/48m	1	0	249	8	0	25	152	1	4	0	15
D-G	62s/59m	0	0	145.5	6	0	26	156	0	3	0	14
D-H	45s/47m	1	0	154.5	1	0	25	167	2	5	0	11
D-I	30s/22m	0	0	135.5	0	0	29	179	1	4	0	16
D-L	33s/42m	0	0	162.5	5	0	25	159	2	5	0	11
D-M	16s/50m	0	0	139.5	6	0	27	156	0	3	0	15
B/D-G	65s/56m	0	0	158.8	8	0	28	160	0	3	0	14
B/D-H	48s/44m	1	0	96	3	0	27	171	2	5	0	11
B/D-I	33s/29m	0	0	164	2	0	31	183	1	4	0	16
B/D-L	36s/39m	0	0	200	7	0	27	163	2	5	0	11
B/D-M	19s/47m	0	0	158	8	0	29	160	0	3	0	15

Table 3.2.5-2 – Interstate 66 Project Related Impacts by Alternative to the Natural Environment

Composite Impact Summary per Alternative Combination (Ecological Resources)																		
	Impacts																	
Alternatives	**DBNF Holdings** (acres)	**Cliffline Habitat** (acres)	**DBNF Old Growth Prescription Areas** (acres)	**DBNF Riparian Prescription Areas** (acres)	**Forested Habitat** (acres)	**Federal Listed Species*** (# of sites)[1]	**Forest Fragmentation** (linear feet)	**Non federal Listed KSNPC Species**** (# of sites)[1]	**Karst Features** (# of sites)[1]	**Perennial Stream** (linear feet)	**Intermittent Stream** (linear feet)	**Ephemeral Stream Impacts** (linear feet) [2]	**Floodplain Impacts** (acres)	**Wetlands** (assigned impact value) [3]	**Jurisdictional Wetlands** (acres)	**Wild and Scenic River and Wild River** (acres)	**Appalachian Mesophytic Forest** (acres) [4]	**High Quality Mussel Habitat** (acres)[5]
Pulaski County Alternative																		
Alt. K	5.90	19.10	0	112.75	481.88	11	2553	1	211	19,926	17,140	11,148	6.50	7.19	6.90	5.42	0	0.10
KY 80 Shifted	5.90	19.07	0	103.62	514.31	11	0	0	181	21,493	15,847	9,977	15.32	13.19	7.37	5.49	0	0.05
KY 80 Modified	5.09	18.57	0	112.63	568.99	13	0	1	262	26,041	15,603	12,034	58.78	8.24	9.84	6.22	0	0.10
Alt. B	9.90	19.31	0	93.51	499.54	11	2553	0	80	14,113	13,636	11,251	5.59	4.99	4.43	5.46	0	0.20
Alt. D	15.22	18.98	0	24.45	606.66	12	28,488	2	137	8,787	20,097	19,671	7.02	5.79	3.52	5.45	0	0.46
Alt. B/D	15.22	18.98	0	24.45	485.37	11	2,857	0	80	7,797	14,739	9,176	4.91	4.22	3.26	5.45	0	0.19
Laurel County Alternative																		
Alt. G	192.07	71.55	0	134.08	399.04	4	8,108	0	0	23,642	17,961	26,678	18.34	14.10	13.84	13.81	3.13	0.61
Alt. H	258.77	47.12	30.61	142.50	433.19	3	26,755	0	0	17,293	21,528	30,759	22.21	23.93	13.07	13.81	3.13	0.68
Alt. I	365.99	86.53	33.45	155.62	569.19	4	34,902	0	0	17,103	19,237	26,139	6.35	10.10	5.85	13.81	0	0.58
Alt. L	192.07	57.49	0	123.99	406.94	3	8,313	0	0	17,278	17,961	22,171	6.65	22.84	11.16	13.81	3.13	0.69
Alt. M	192.07	71.55	0	134.08	407.83	4	12,493	0	0	21,797	16,945	21,009	4.92	25.51	11.77	13.81	3.13	0.61
Alternative Combinations (From Above; One Pulaski County Alternative + One Laurel County Alternative = I-66 Project from Somerset to London)																		
No Build	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
K-G	197.97	90.64	0	246.83	880.92	15	10,661	1	211	43,568	35,101	37,826	24.84	21.29	20.74	19.23	3.13	0.71
K-H	264.67	66.21	30.61	255.25	915.07	14	29,308	1	211	37,219	38,668	41,907	28.71	31.12	19.97	19.23	3.13	0.78
K-I	371.89	105.63	33.45	268.37	1051.07	15	37,455	1	211	37,029	36,377	37,287	12.85	17.29	12.75	19.23	0	0.78
K-L	197.97	76.59	0	236.74	888.82	14	10,866	1	211	37,204	35,101	33,319	13.15	30.03	18.06	19.23	3.13	0.69
K-M	197.97	90.64	0	246.83	889.71	14	15,046	1	211	41,723	34,085	32,157	11.42	32.70	18.67	19.23	3.13	0.71
KY80 Mod-G	197.16	90.12	0	246.71	968.03	17	8,108	1	262	49,683	33,564	38,712	77.12	22.34	23.68	20.03	3.13	0.71
KY80 Mod-H	263.86	65.69	30.61	255.13	1002.18	16	26,755	1	262	43,334	37,131	42,793	80.99	32.17	22.91	20.03	3.13	0.78
KY80 Mod-I	371.08	105.10	33.45	268.25	1138.18	17	34,902	1	262	43,144	34,840	38,173	65.13	18.34	15.69	20.03	0	0.78

*Federal Listed Species includes federally endangered, threatened, candidate, and species of management concern species.
**KSNPC listed species already considered in the Federal Listed Species Column are not considered in the KSNPC Listed Species column.
[1] Indicates direct impacts (i.e., the number of times an alternative crosses an area with a known federal or KSNP-listed species or karst feature.
[2] Figures were adjusted to account for ROW roadway drainages.
[3] Figures were adjusted to account for weighting based on Cowardin wetland classification and wetland function and value, and ROW roadside drainages.
[4] After adjustment excluding KY80 fill.
[5] Based on substrate habitat quality for a preponderance of freshwater mussel species (73%) found in a sand/gravel/cobble substrate (Cicerello and Schuster 2003).

Table 3.2.5-2 – Interstate 66 Project Related Impacts by Alternative to the Natural Environment

Composite Impact Summary per Alternative Combination (Ecological Resources)																		
	Impacts																	
Alternatives	**DBNF Holdings** (acres)	**Cliffline Habitat** (acres)	**DBNF Old Growth Prescription Areas** (acres)	**DBNF Riparian Prescription Areas** (acres)	**Forested Habitat** (acres)	**Federal Listed Species*** (# of sites)[1]	**Forest Fragmentation** (linear feet)	**Non federal Listed KSNPC Species**** (# of sites)[1]	**Karst Features** (# of sites)[1]	**Perennial Stream** (linear feet)	**Intermittent Stream** (linear feet)	**Ephemeral Stream Impacts** (linear feet) [2]	**Floodplain Impacts** (acres)	**Wetlands** (assigned impact value) [3]	**Jurisdictional Wetlands** (acres)	**Wild and Scenic River and Wild River** (acres)	**Appalachian Mesophytic Forest** (acres) [4]	**High Quality Mussel Habitat** (acres)[5]
KY80 Mod-L	197.16	76.06	0	236.62	975.93	16	8,313	1	262	43,319	33,564	34,205	65.43	31.08	21	20.03	3.13	0.69
KY80 Mod-M	197.16	90.12	0	246.71	976.82	17	12,493	1	262	47,838	32,548	33,043	63.70	33.75	21.61	20.03	3.13	0.71
KY80 Shifted-G	197.97	90.61	0	237.70	913.35	15	8,108	0	181	45,135	33,808	36,655	33.66	27.29	21.21	19.30	3.13	0.66
KY80 Shifted-H	264.67	66.19	30.61	246.12	947.50	14	26,755	0	181	38,786	37,375	40,736	37.53	37.12	20.44	19.30	3.13	0.73
KY80 Shifted-I	371.89	105.60	33.45	259.24	1083.50	15	34,902	0	181	38,596	35,084	36,116	21.67	23.29	13.22	19.30	0	0.73
KY80 Shifted-L	197.97	76.56	0	227.61	921.25	14	8,313	0	181	38,771	33,808	32,148	21.97	36.03	18.53	19.30	3.13	0.64
KY80 Shifted-M	197.97	90.61	0	237.70	922.14	15	12,493	0	181	43,290	32,792	30,986	20.24	38.70	19.14	19.30	3.13	0.66
B-G	201.97	90.85	0	227.59	898.58	15	10,661	0	80	37,755	31,597	37,929	23.93	19.09	18.27	19.27	3.13	0.81
B-H	268.67	66.43	30.61	236.01	932.73	14	29,308	0	80	31,406	35,164	42,010	27.80	28.92	17.5	19.27	3.13	0.88
B-I	375.89	105.84	33.45	249.13	1068.73	15	37,455	0	80	31,216	32,873	37,390	11.94	15.09	10.28	19.27	0	0.88
B-L	201.97	76.80	0	217.50	906.48	14	10,866	0	80	31,391	31,597	33,422	12.24	27.83	15.59	19.27	3.13	0.79
B-M	201.97	90.85	0	227.59	907.37	15	15,046	0	80	35,910	30,581	32,260	10.51	30.50	16.2	19.27	3.13	0.81
D-G	207.29	90.52	0	158.53	1005.70	16	36,596	2	137	32,429	38,058	46,349	25.36	19.89	17.36	19.26	3.13	1.07
D-H	273.99	85.19	30.61	166.95	1039.85	15	55,243	2	137	26,080	41,625	50,430	29.23	29.72	16.59	19.26	3.13	1.14
D-I	381.21	124.61	33.45	180.07	1175.85	16	63,390	2	137	25,890	39,334	45,810	13.37	15.89	9.37	19.26	0	1.14
D-L	207.29	76.47	0	148.44	1013.60	15	36,801	2	137	26,065	38,058	41,842	13.67	28.63	14.68	19.26	3.13	1.05
D-M	207.29	90.52	0	158.53	1014.49	16	40,981	2	137	30,584	37,042	40,680	11.94	31.30	15.29	19.26	3.13	1.07
B/D-G	207.29	90.52	0	158.53	884.41	15	10,965	0	80	31,439	32,700	35,854	23.25	18.32	17.1	19.26	3.13	0.80
B/D-H	273.99	85.19	30.61	166.95	918.56	14	29,612	0	80	25,090	36,267	39,935	27.12	28.15	16.33	19.26	3.13	0.87
B/D-I	381.21	124.61	33.45	180.07	1054.56	15	37,759	0	80	24,900	33,976	35,315	11.26	14.32	9.11	19.26	0	0.87
B/D-L	207.29	76.47	0	148.44	892.31	14	11,170	0	80	25,075	32,700	31,347	11.56	27.06	14.42	19.26	3.13	0.78
B/D-M	207.29	90.52	0	158.53	893.20	15	15,350	0	80	29,594	31,684	30,185	9.83	29.73	15.03	19.26	3.13	0.08

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**KSNPC listed species already considered in the Federal Listed Species Column are not considered in the KSNPC Listed Species column.
[1] Indicates direct impacts (i.e., the number of times an alternative crosses an area with a known federal or KSNP-listed species or karst feature.
[2] Figures were adjusted to account for ROW roadway drainages.
[3] Figures were adjusted to account for weighting based on Cowardin wetland classification and wetland function and value, and ROW roadside drainages.
[4] After adjustment excluding KY80 fill.
[5] Based on substrate habitat quality for a preponderance of freshwater mussel species (73%) found in a sand/gravel/cobble substrate (Cicerello and Schuster 2003).